

Mr. H. N. RIDLEY AND THE FLORA OF THE NETHERLANDS INDIES.

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The series of island-groups, which extend from further India to Australia, and which are situated between 95° and 141° east longitude and between 6° north and 11° south of the equator, belong to the overseas territory of the Kingdom of the Netherlands, with the exception of the Philippines, Sarawak and British North Borneo, Portuguese Timor, Christmas Island and the Territories of British New Guinea. If one compares the extent and area of the Netherlands East Indies with those of Europe or the United States of America, one finds that the east to west extent of the N.E.I. is approximately equal to the distance from the West Coast of Ireland to the East Coast of the Caspian and from 7° to the West of San Francisco to 7° to the East of New York, the maximum length from West to East of the Netherlands East Indies (*i.e.* from Pulau Weh to Humboldt Bay) being about 5,000 km. The maximum distance from North to South is 2,000 km., which is equal to the distance between Oslo and Rome and as far as from the North coast of Michigan Lake to New Orleans (Louisiana).

The total area covered by all the islands of the Netherlands Indian Archipelago measures 1,900,152 km.², which equals about half the size of Europe, excluding Russia. In order to give some idea of the size of the islands we mention the following details: *Java*, including Madoera, has an area of 131,508 km.² (*i.e.* about the same size as the State of New York), *Sumatra* with the surrounding islands an area of 420,384 km.² (exceeding the area of Great Britain), *Borneo*, as far as the Dutch territory is concerned, covers an area of 553,341 km.² (which is as large as France), *Celebes* and the small islands in the immediate neighbourhood an area of 185,914 km.² (being about the same size as New Zealand and Ceylon taken together) and the Dutch section of *New Guinea* one of 397,204 km.² (*viz.* the same area as Japan proper), while the rest of the Archipelago measures 211,801 km.²

The botanists, who have to study the vegetation and the immensely rich flora of an area covering approximately 1,900,152 square kilometers, have to perform—as everybody will understand—a very difficult and lengthy task. Though the climatic conditions (uniformity of temperature and changes in rainfall, both intensified by the high mountain ranges which intersect the

islands) are very similar throughout this vast tropical area, so that the number of vegetation types is very limited, yet from the differences in the local soil conditions (water, edaphic factors, volcanic material, etc.) has arisen such a complex flora, that the very same vegetation-type shows in various places a large diversity as to the constituent flora-elements.

The total flora of flowering plants may confidently be estimated to comprise 30,000 species, belonging to about 2,500 genera. It will be many years yet before all islands of the Archipelago are intensively explored botanically and before such a wonderfully rich flora is thoroughly known, the more so as the flora of each island presents a small or high percentage of endemic species. This flora could not form a subject of systematic investigation until the foundation of the Botanic Gardens at Buitenzorg in 1817. Its study was taken up energetically by the second Director of the Gardens, C. L. BLUME, and has been continued up till the present.

This study is progressing but slowly, on account of the vastness of the territory, and also of the fact that during many years this task was entrusted to a few botanists only. Moreover, in Buitenzorg the standpoint is taken, that our knowledge of the flora ought to be based on a thorough monographic study of the families; this has found expression in contributions to the *Bulletin du Jardin Botanique de Buitenzorg*. To further this object, contact has long been developed with botanists from abroad for co-operation in the study of the Malaysian flora. The researches of those botanists who concern themselves with the study of a closely related flora, are therefore of direct importance. Many individuals are cited in literature as having studied more or less botanical material from this Archipelago. Among the most prominent of these is Mr. H. N. RIDLEY.

Mr. RIDLEY's course of life once more proves how profitable it is for men of outstanding ability to be employed in the tropics for a considerable period of years; in this way important work can be accomplished without interruption and along the same lines. Well-known examples of this are the celebrated RUMPHIUS, TEYSMANN and TREUB, the last two of whom by their very long service in the tropics were able to found and consolidate the Botanic Gardens at Buitenzorg.

It has been given to Mr. RIDLEY also to spend a long period in the tropics, as a result of which he became one of the founders of our knowledge of the flora of the Malay Peninsula. Being evidently very zealous in fulfilling his botanical duties, he based the study of this flora not only on herbarium specimens, but also himself collected large numbers of plants during inspection trips.

His large collections, of which he deposited duplicate sets in many herbaria, including Buitenzorg, form, with other older ones, the essential basis of our knowledge of the exceedingly rich flora of the Malay Peninsula. He did not confine his trips to this Peninsula, but he also made expeditions to the Malay Archipelago, viz. to Christmas Island (1890 and 1904), Java (1915), Sumatra (1897 and 1921) and Borneo, as a result of which he was in a position to compare the floras of these regions. So far as the Netherlands Indies are concerned, it is only from New Guinea that he has studied an important collection of plants without having visited the country of origin. The number of species he named as new to science amounts to a few thousands; the number described by him from the Netherlands Indies (including British North Borneo, Sarawak and British New Guinea) so far as I have been able to trace—is 1,053, divided over the different islands as follows: British New Guinea 391, Sumatra and surrounding islands 329, Sarawak British North Borneo and Dutch Borneo 322, Java 6, Celebes 2, Ambon, Key and Aru Islands each 1.

Now it may be true that the majority of these plants described as new by Mr. RIDLEY originated from outside the Netherlands Indies; but phytogeographically the flora of the Malay Archipelago appears to be so closely related to that of the Malay Peninsula, that the systematic work of RIDLEY implies an important progress for our knowledge of the flora of the Malay Archipelago also.

Already before he became Director of the Botanic Gardens at Singapore, viz. in 1884, he published in the Journal of Botany some articles about the flora of the Malaysian Archipelago; the description of a new Bornean orchid (a new diagnosis of *Didymoplexis sylvatica* (Bl.) RIDLEY) belonging to the Javan collection of HORSFIELD, formed the first contact. In 1885 he described in the same journal a new *Carex* (viz. *C. tartarea* RIDLEY), collected in Sumatra by Dr. H. O. FORBES, while one year later he published a study on the Monocotyledonous plants of New Guinea, collected by the same (followed in 1925 by a study of FORBES's Javan and Sumatran Monocotyledones). Later, various contributions about the flora of the Malay Archipelago have been issued, most of them concerning Borneo and Sumatra.

RIDLEY made his first visit to Sumatra in 1897, to the Siak district in the South. He did not have a second opportunity for a visit to this island until 24 years later; he jumped at this occasion as he "was anxious to visit other parts of Sumatra before (his) Eastern travels came to an end". In spite of the great amount of work which has since been done, the beginning of RIDLEY's account of this botanical excursion to Northern

Sumatra, viz. to Brastagi and the Sibayak Volcano is still true : "The flora of Sumatra is at present still very little known, so that the account of even a short excursion especially in the quite unexplored northern part of the island is a contribution to the history of its flora". To know this history of the Sumatran flora as completely as possible is the prime requisite before cultivation, which is rapidly extending, makes it impossible for ever. Owing to the marked similarities that exist between the flora of Sumatra and that of the Malay Peninsula, a thorough knowledge of the flora of the latter territory is of the greatest importance in a study of that of Sumatra, though the Sumatran flora has certain peculiar characteristics, so that MERRILL's opinion may be correct : "So far as I can judge at the present time, somewhere between 40 and 50 per cent. of the known Sumatran species are endemic, so that no published flora of any neighbouring region can be expected to be more than an aid to the determination of Sumatran material".

As to Borneo the words of RIDLEY in 1913 : "very much remains to be done even in the best-known district", agree also with the present situation of 20 years later : on account of its enormous densely forested areas, sparse population, few roads and difficult transportation, Borneo has been only slightly explored botanically. How exceedingly rich its flora is, is illustrated by the extensive and very interesting Kinabalu collections made a few years ago by Mrs. MARY and Chaplain J. CLEMENS : these collections, among the largest ever made in Borneo, are very important to our knowledge of the Bornean flora, though that lofty mountain had already received attention from several botanists. RIDLEY himself, who visited Sarawak in September 1905, has written many essays about the flora of Borneo, working through the important collections made by Dr. HAVILAND and Bishop HOSE in Sarawak.

From the foregoing it is evident that Mr. RIDLEY's work has in large measure been devoted to systematic studies : the name of RIDLEY will always be associated with work on the flora of the Malay Peninsula. He has further been much concerned with the geographical distribution of plants and with the development of species; his interest in these subjects finds expression in several of his published papers. This also may have underlain his great work entitled "*The dispersal of plants throughout the world*", which begins as follows : "The study of the Dispersal of Plantsis one of very great importance in its bearing on the distribution of plants throughout the world, the causes of their presence or absence in different localities, the changes of floras at different periods and all that goes to make a local flora. It has also been an important factor in the evolution of species, genera, and, in some cases, even of orders". For long years

considerable attention was given by him to this subject: already in 1905 in his description of the botany of Christmas Island, he devoted a detailed chapter to the dissemination of the plants of this island, which presented such an excellent occasion for his purpose, being a true oceanic island, as it "has never at any time been connected with the mainland of Java or with any other land", and as "it is an extinct volcano covered with coral reefs of various ages from the eocene period to the present day".

Moreover by his studies of economic plants, RIDLEY proved that there exists an admirable opportunity for co-operative productive work. Some of his publications are of such great importance for the Netherlands Indies, that they have been translated into Dutch. In "*The Timbers of the Malay Peninsula*" (De Maleische timmerhoutsoorten) timbers are concerned, which are distributed throughout the Malayan region. However, RIDLEY'S excellent study was a valuable addition to publications already existing, in which mainly Javan timbers were described, the descriptions of RIDLEY referring for the first time to timbers from Sumatra.

RIDLEY'S *Malay drugs* (De inlandsche geneesmiddelen der Maleiers) originated in 1894 from a lecture about the Malayan "Materia medica". The medicines, used in the Malay Peninsula, agree so well in nature and even in their names with those from Java and Sumatra, that in this case too the importance of a translation is quite conspicuous.

This very year MERRILL, who has also done so much for the knowledge of the Malaysian flora, has once more broken a lance for the value of international co-operation among scientists in the introduction of part I of the "*Chronica Botanica*" (1935). Let us finish with his words, for which he could have cited RIDLEY'S work in affirmation: ".....science is necessarily world-wide in its scope. An outstanding scientific development in one country is followed with interest and appreciation in all other countries, to a degree scarcely reached in any other group of thinking people. Particularly among botanists has international co-operation been developed, ever since the need of international co-operation was indicated through the development of its basic branch, Taxonomy. Plants are not subject to political boundaries, and the problems of plant science cover the world in all fields. The continued harmony among botanists in these days of stress, international discord, and internal difficulties, as widely separated as they are in the fields in which they specialize and the institutions of which they are a part, may well influence international co-operation among other groups".